US009439719B2

(12) **United States Patent**
Sheng

(10) **Patent No.: US 9,439,719 B2**
(45) **Date of Patent: Sep. 13, 2016**

(54) **OPERATION HANDLES FOR ELECTROCAUTERY**

(71) Applicant: **GETAC TECHNOLOGY CORPORATION**, Hsinchu County (TW)

(72) Inventor: **Yen-Long Sheng**, Taipei (TW)

(73) Assignee: **Getac Technology Corporation**, Hsinchu County (TW)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 385 days.

(21) Appl. No.: **14/274,631**

(22) Filed: **May 9, 2014**

(65) **Prior Publication Data**

US 2015/0320484 A1 Nov. 12, 2015

(51) **Int. Cl.**

A61B 1/00	(2006.01)
A61B 18/14	(2006.01)
A61B 19/00	(2006.01)
A61B 17/29	(2006.01)
A61B 17/00	(2006.01)
A61B 18/00	(2006.01)

(52) **U.S. Cl.**

CPC ***A61B 18/1445*** (2013.01); ***A61B 17/2909*** (2013.01); ***A61B 19/22*** (2013.01); *A61B 2017/0042* (2013.01); *A61B 2017/00438* (2013.01); *A61B 2017/2911* (2013.01); *A61B 2017/2946* (2013.01); *A61B 2018/0091* (2013.01); *A61B 2018/00595* (2013.01); *A61B 2018/00922* (2013.01); *Y10T 74/20396* (2015.01)

(58) **Field of Classification Search**

CPC A61B 18/1445; A61B 19/22; A61B 2017/00438; A61B 2017/0042; A61B 2018/00922; A61B 2018/00595

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,193,718	B1 *	2/2001	Kortenbach	A61B 18/1445 606/45
2010/0069903	A1 *	3/2010	Allen, IV	A61B 17/2816 606/45
2011/0306952	A1 *	12/2011	Chen	A61B 17/29 606/1
2012/0004652	A1 *	1/2012	Moua	A61B 18/1206 606/33
2013/0023911	A1 *	1/2013	Esanu	A61B 17/122 606/158
2015/0320484	A1 *	11/2015	Sheng	A61B 18/1445 74/491
2015/0331443	A1 *	11/2015	Lamser	G05G 5/005 74/532

FOREIGN PATENT DOCUMENTS

CN	101035482 A	9/2007
TW	M428027	5/2012

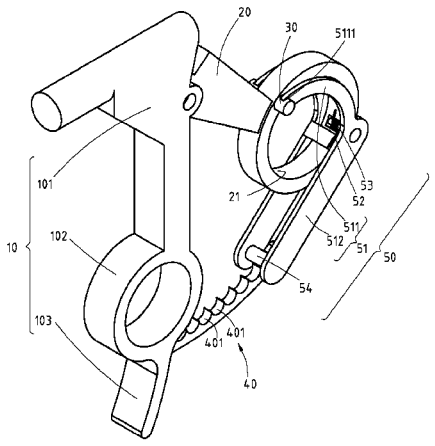
* cited by examiner

Primary Examiner — David M Fenstermacher

(57) **ABSTRACT**

An operation handle for electrocautery includes: a grip, an operation rod, a stopping part, a positioning bar, and a driven member. One end of the operation rod is jointly connected to the grip, and the other end has a pressing portion. The operation rod moves selectively from an initial position to at least one work position. The stopping part is disposed on the operation rod and adjacent to the pressing portion. The positioning bar is disposed on the grip and comprises at least one positioning groove. When the pressing portion of the operation rod is forced, the operation rod moves from the initial position to the at least one work position, and one end of the driven member is lodged in the at least one positioning groove.

9 Claims, 9 Drawing Sheets



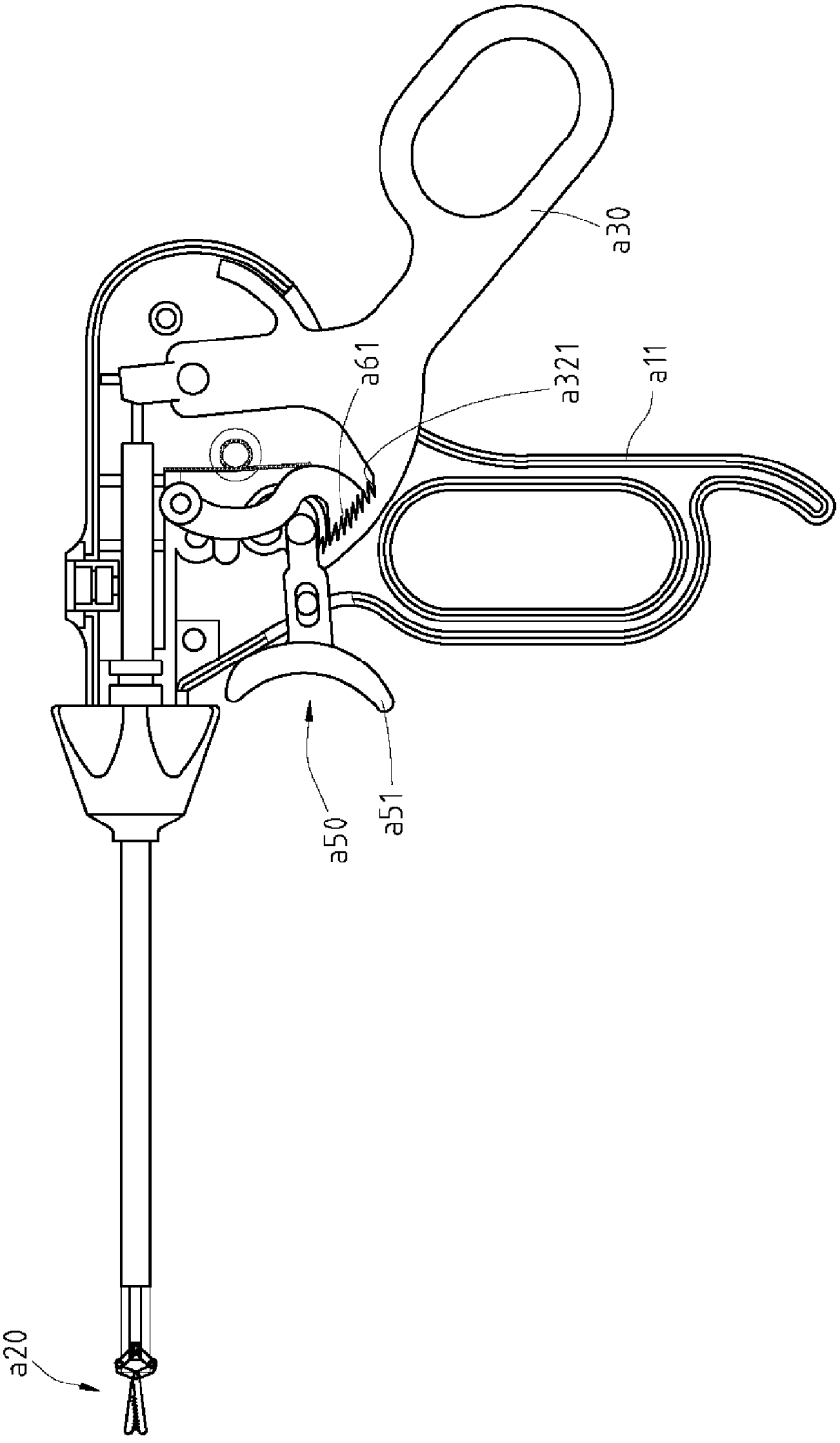


FIG. 1 (Prior Art)

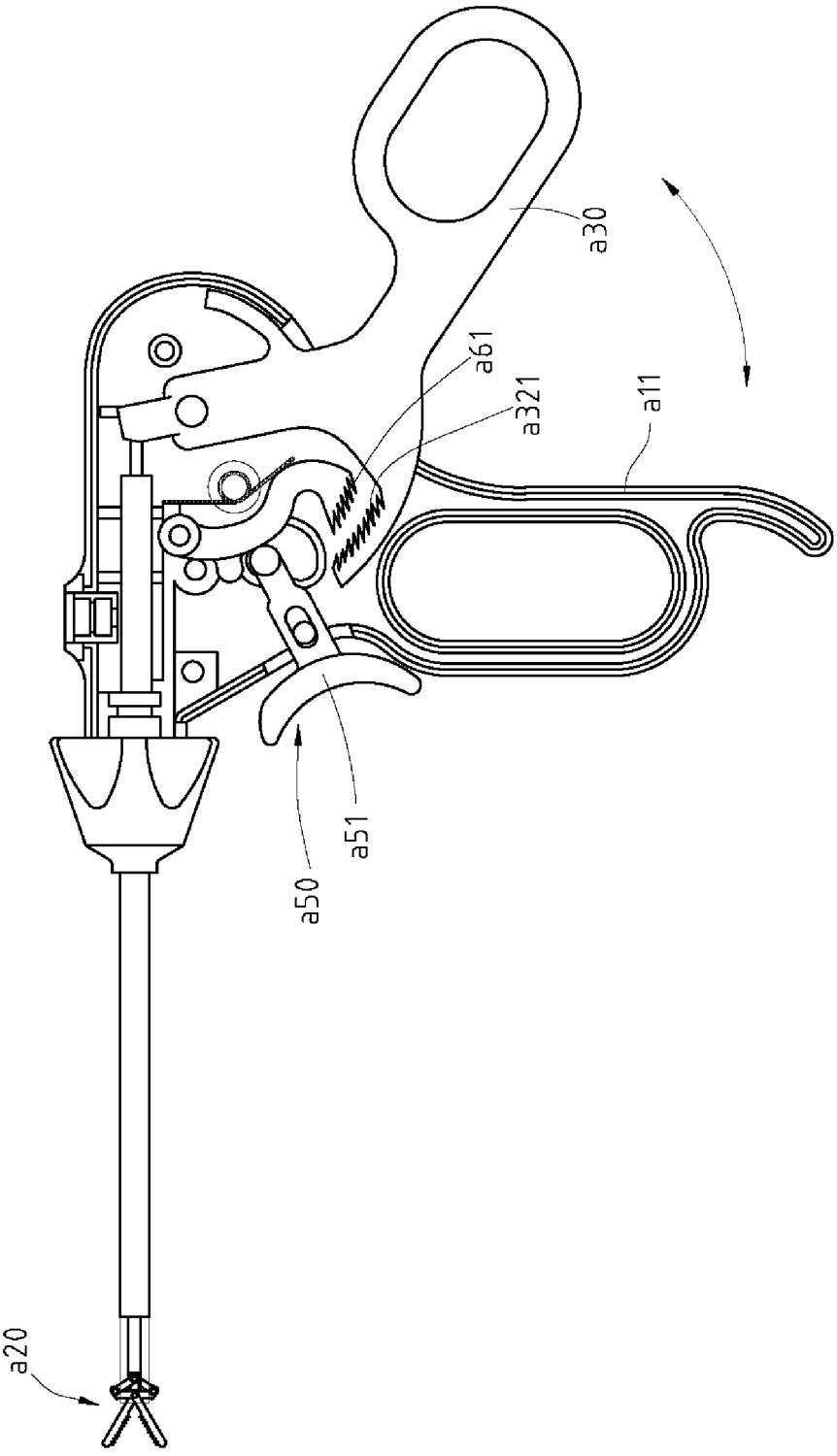


FIG. 2 (Prior Art)

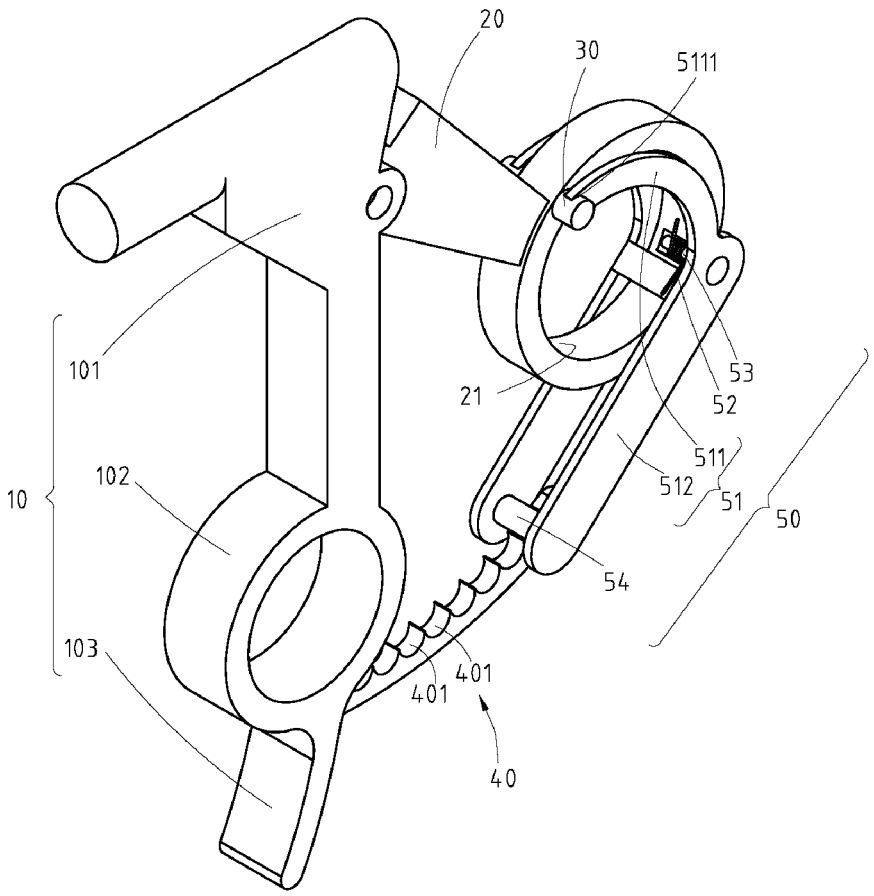


FIG. 3

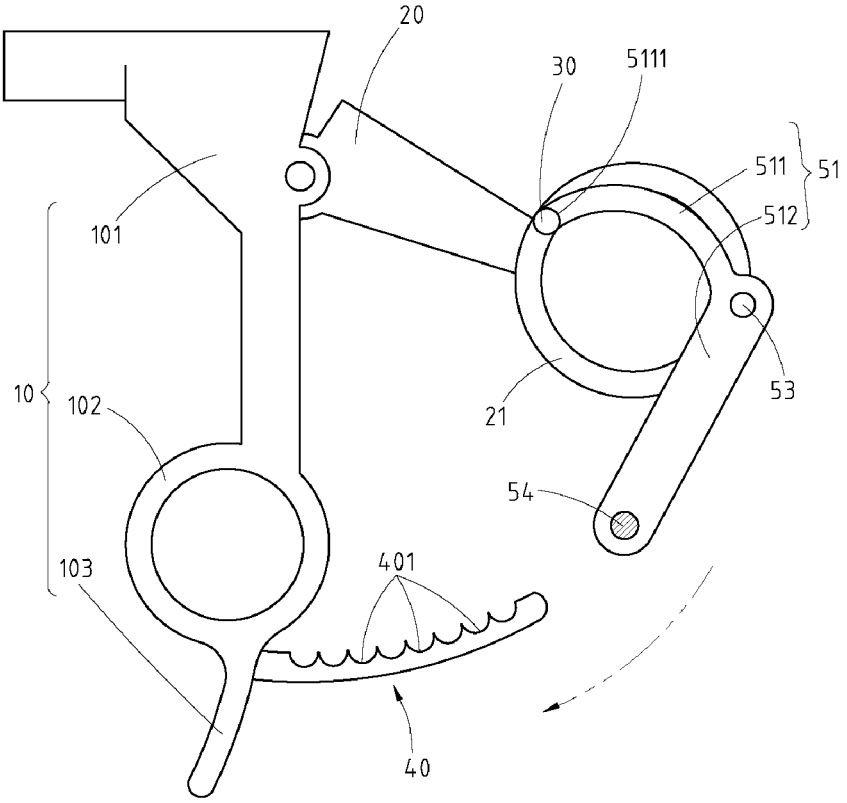


FIG. 4

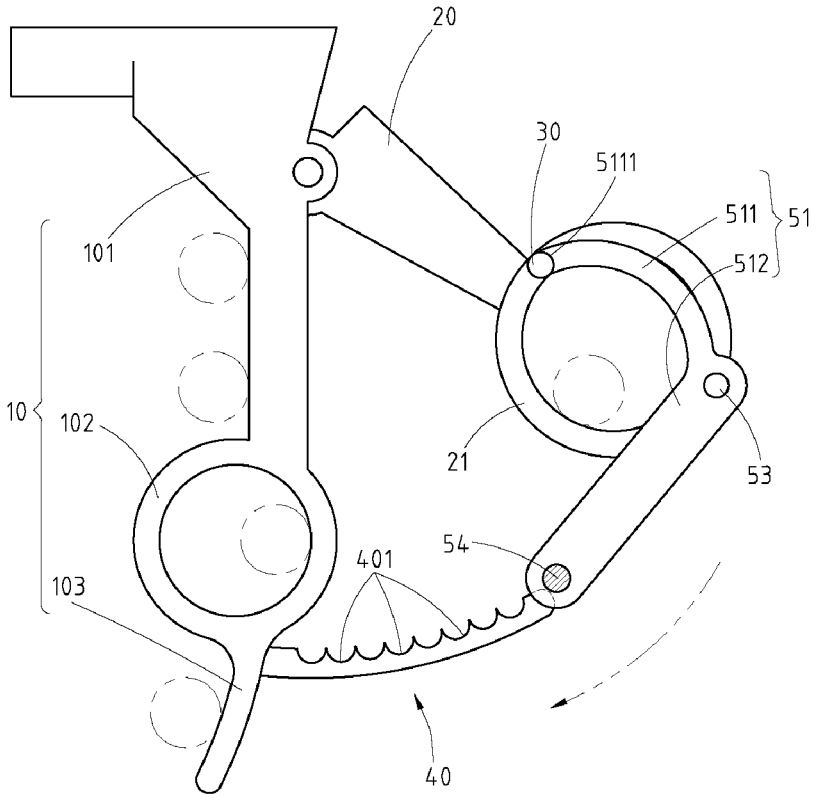


FIG. 5

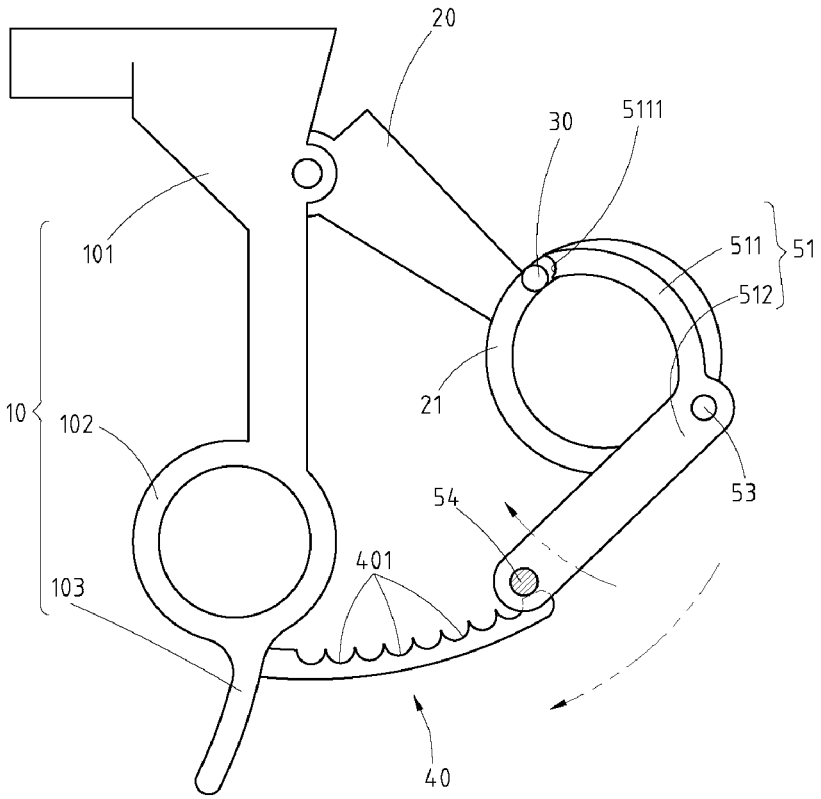


FIG. 6

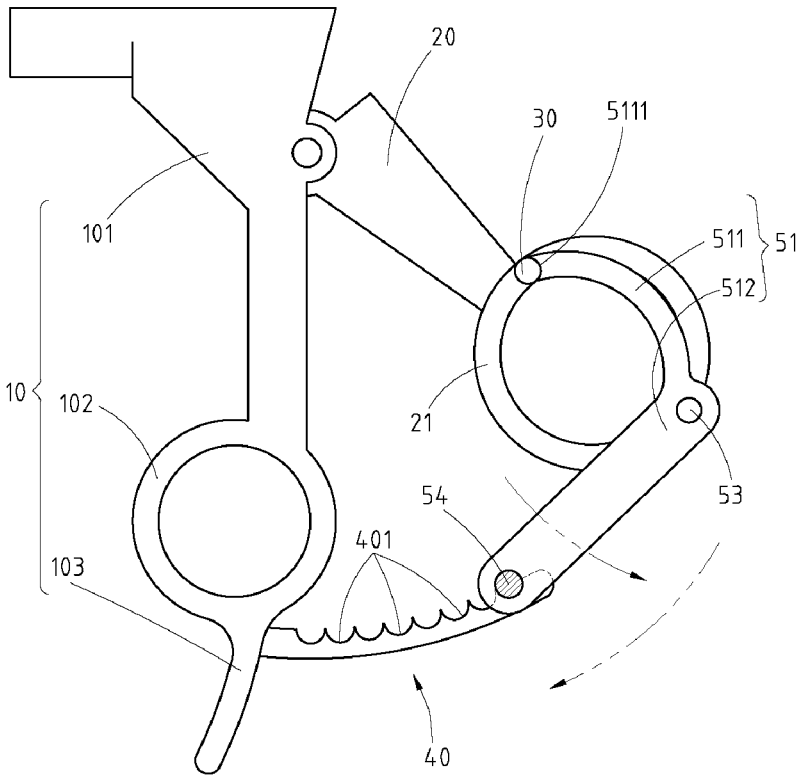


FIG. 7

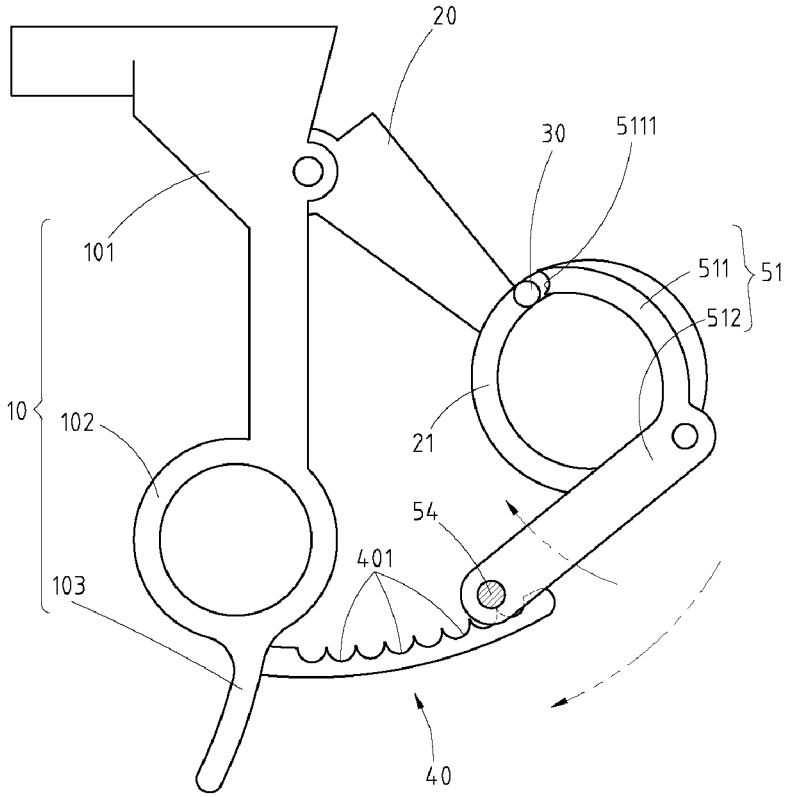


FIG. 8

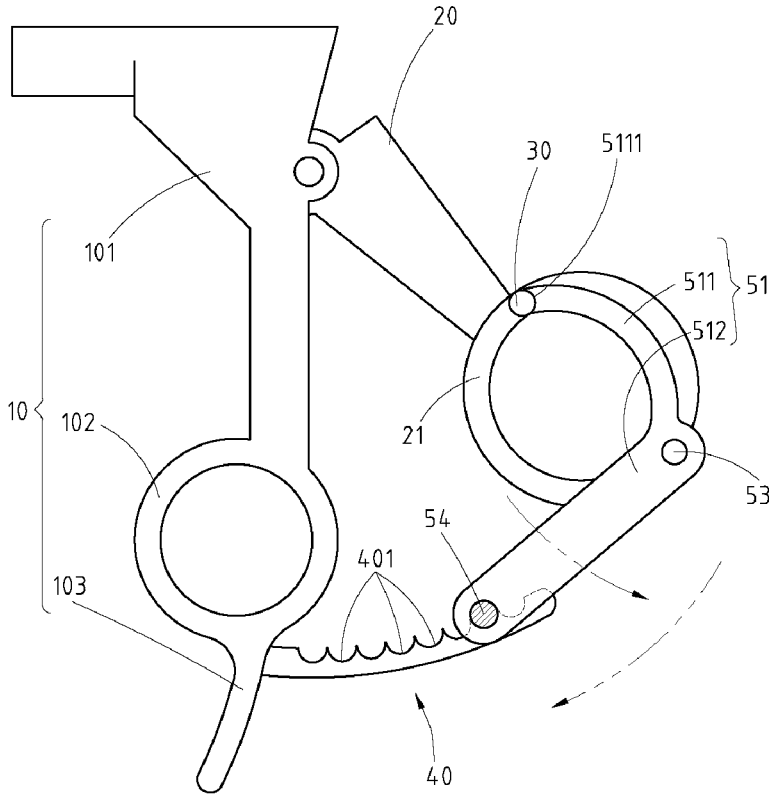


FIG. 9

OPERATION HANDLES FOR ELECTROCAUTERY

BACKGROUND

1. Technical Field

The present invention relates to operation handles, and more generally to operation handles for electrocautery.

2. Related Art

During surgical operations, it is common to use surgical instruments such as scissors and jaw members to cut or clamp a patient's tissues. It is also common to use surgical instruments such as electrosurgical instruments for cutting, sealing or stopping bleeding of an affected part or a wound. Currently, there are many surgical instruments, such as electrocautery, with handles for doctors to operate intuitively when cutting or clamping.

FIGS. **1** and **2** show surgical instruments with jaw members. When a doctor wants to use jaw members a**20** to clamp something, they may pull the second handle a**30** close to the handle all. Meanwhile, the positioning cogs a**321** and the locking cogs a**61** are engaged with each other, so the second handle a**30** may be locked at a fix position for the jaw members a**20** to clamp something. At the same time, even if the doctor's hand is away from the second handle a**30** and the handle all, the jaw members a**20** continue clamping by the engagement of the positioning cogs a**321** and the locking cogs a**61**.

When the doctor wants to release the clamping, they must press a pressing part a**51** of a controlling element a**50**, so the locking cogs a**61** may be released from the positioning cogs a**321**. At the same time, the doctor must move the second handle a**30** away from the handle all. During an operation, four fingers of the doctor may be located at the handle all and the thumb may be located at the second handle a**30** for the engagement by pulling the second handle a**30**. However, under the engagement release, one forefinger or one middle finger must press the pressing part a**51**. That is, the pressing part a**51** is pressed toward to the second handle a**30**. However, the other three fingers remain located at the handle all to hold the handle all. At the same time, the thumb, located at the second handle a**30**, must move the second handle a**30** backward away from the handle all.

As a result, the doctor must use one finger pressing forward and the other finger moving backward. Mastering such a release procedure requires repeated practice. Consequently, when the doctor first uses this kind of instrument, the learning curve required to develop skill with the instrument is high.

SUMMARY

Accordingly, the present invention provides an operation handle for electrocautery comprising: a grip, an operation rod, a stopping part, a positioning bar, and a driven member. The operation rod has two ends, one end is jointly connected to the grip, and the other end has a pressing portion. The operation rod moves selectively from an initial position to at least one work position. The stopping part is disposed on the operation rod and adjacent to the pressing portion. The positioning bar is disposed on the grip and comprises at least one positioning groove. The driven member comprises a driven rod and a torsional spring, wherein the driven rod is jointly connected to the operation rod and adjacent to the pressing portion. An end of the torsional spring is disposed against the operation rod, and another end of the torsional spring is selectively disposed against the driven rod. The torsional spring pushes against the driven rod so as to allow an end of the driven rod selectively stopping against the stopping part. When the pressing portion of the operation rod is forced, the operation rod moves from the initial position to the at least one work position, and another end of the driven rod is lodged in the at least one positioning groove.

When a doctor is in an operation, their thumb is located in the pressing portion, and their other four fingers are located in the grip. The thumb presses the pressing portion so as to move the operation rod from the initial position to the work position. The initial position may be release position, and the work position may be in clamping position. When the operation rod is located at the work position by pressing the pressing portion, one end of the driven rod is lodged in any one of the positioning grooves of the positioning bar. Whereby, the operation rod is fixed at the work position as required. Consequently, when the hand of the doctor is away from the grip and the operation rod, the operation rod maintains the work position, so the electrocautery may maintain working status or clamping status.

When the doctor wants to release the working status or clamping status, they may only need to move the operation rod away from the grip, i.e. their thumb presses the operation rod away from the grip. Consequently, it may allow the doctor to use the operation handles as scissors without any further practice or a lengthy learning curve. Accordingly, the doctor may be skilled to the operation handle promptly, without thinking about releasing the clamping status.

It is to be understood that both the foregoing general description and the following detailed description presented below are intended to provide an overview or framework for understanding the nature and character of the disclosure as it is claimed. The accompanying drawings are included to provide a further understanding of the disclosure, and are incorporated into and constitute a part of this specification. The drawings illustrate various embodiments of the disclosure, and together with the description serve to explain the principles and operations of the disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGS. **1-2** are schematic diagrams of a traditional surgical instrument in different status;

FIG. **3** is schematic diagram of an operation handle in accordance with a first embodiment of the present invention;

FIG. **4** is a side view of the operation handle in accordance with the first embodiment of the present invention; and

FIGS. **5-9** are a side views of the operation handle in accordance with the first embodiment of the present invention showing the movement of the operation handle.

DETAILED DESCRIPTION

Reference is now made in detail to various embodiments of the disclosure, examples of which are illustrated in the accompanying drawings. Whenever possible, the same or like reference numbers and symbols are used throughout the drawings to refer to the same or like parts. The drawings are not necessarily to scale, and one skilled in the art will recognize where the drawings have been simplified to illustrate the key aspects of the disclosure.

Please refer to FIGS. **3** and **4**, which respectively show a schematic diagram and a side view of an operation handle in accordance with a first embodiment of the present invention. The operation handle of the present invention comprises a grip **10**, an operation rod **20**, a stopping part **30**, a positioning

bar **40**, and a driven member **50**. The grip **10** comprises a body **101**, a finger ring **102**, and a finger rest part **103**. One end of the body **101** connects to an element of surgical instrument such as electrocautery, clamping instrument, etc. The other end of the body connects to the finger ring **102**. The finger rest part **103** connects to the finger ring **102** in opposite direction to the body **101**. The body **101** and the finger rest part **103** are respectively connected to the finger ring **102** in opposite direction. When in use, a doctor may put the third finger through the finger ring **102**, put the forefinger and the middle finger on the body **101** above the finger ring **102**, and put the little finger on the finger rest part **103**. Thus, the handling of the operation handle may be more smoothly and conveniently.

One end of the operation rod **20** is jointly connected to the grip **10**, and the other end has a pressing portion **21**. The pressing portion **21** may be shaped as a round ring. The big thumb may be put into the round ring and press the inner wall of the round ring. The stopping part **30** is disposed on the operation rod **20** and adjacent to the pressing portion **21**. In the present embodiment, the stopping part **30** is a pillar, as shown in FIG. **3**. However, in other embodiments, the stopping part **30** may be a pillar with any geometric shape so as to allow an end of the driven rod **50** selectively stopping against the stopping part **30**. The details of the driven member **50** are described below.

The positioning bar **40** is disposed on the finger ring **102** of the grip **10**, comprising at least one positioning groove **401**. As shown in FIG. **4**, the positioning bar **40** extends outward from the connection of the finger ring **102** and the finger rest part **103** with an arc that is arcing with a center at the jointly connection of the grip **10** and the operation rod **20**. Thus, the positioning bar **40** is substantially shaped as a long arc. When the pressing portion **21** of the operation rod **20** moves close to the finger ring **102** at a fixed work position, the pressing portion **21** touches against the finger ring **102**, but not touching with the positioning bar **40**. The number of the positioning groove **401** may be designed as required for the clamping degrees. In the present embodiment, the positioning grooves **401** are shaped continuously in multi-semicircle tubular.

The driven member **50** comprises a driven rod **51** and a torsional spring **52**. The driven rod **51** is jointly connected to the operation rod **20** and adjacent to the pressing portion **21**. An end of the torsional spring **52** is disposed against the operation rod **20**, and another end of the torsional spring **52** is selectively disposed against the driven rod **51**. As shown in FIG. **3**, a shaft **53** may be used for connecting the torsional spring **52** and the driven rod **51** to the pressing portion **21** of the operation rod **20** at the inner wall of the round ring. Thus, due to the torsion of the torsional spring **52**, an end of the driven rod **51** selectively stopping against the stopping part **30**.

As shown in FIGS. **3** and **4**, the driven rod **51** comprises a first rod **511** and a second rod **512**. The first rod **511** and the second rod **512** are connected and formed substantially as L-shape. In the present embodiment, in order to move the driven rod **51** more smoothly, there are two driven rod **51** disposed in parallel at two sides of the operation rod **20** and jointly fixed by the shaft **53**. However, in other embodiment, there may be used with only one driven rod **51**.

An open end of the first rod **511** is selectively disposed against the stopping part **30**. In order to properly dispose the first rod **511** of the driven rod **51** against the stopping part **30**, the open end of the first rod **511** comprises a recessed portion **5111** corresponding to the shape of the stopping part **30**. For example, the stopping part **30** is a pillar, and the recessed portion **5111** corresponds to the shape of the pillar.

Please refer to FIG. **3**, in which the open end of the second rod **512** is selectively lodged in the positioning groove **401**. In this embodiment, the second rod **512** of the driven rod **51** comprises a positioning cylinder **54** shaped as a pillar, which is corresponding to the shape of the positioning groove **401**. Thus, the positioning cylinder **54** may be fixed temperately into the positioning groove **401**. When the operation rod **20** moves to the work position, the positioning cylinder **54** is lodged in the semicircle tubular positioning groove **401**.

Please refer to FIGS. **5-9**, which show the movement of the operation handle in accordance with the present invention. As shown in FIG. **5**, when in use, at the beginning, the user put the big thumb in the pressing portion **21**, the third finger in the finger ring **102**, the forefinger and the middle finger on the body **101**, and the little finger on the finger rest part **103**.

The user presses the pressing portion **21** of the operation rod by the big thumb, and then the operation rod **20** moves accordingly from an initial position to at least one work position. The initial position means, as shown in FIG. **4**, the status showing the positioning cylinder **54** of the second rod **512** of the driven rod **51** not touching with the positioning bar **40**. Or, the initial position means, as shown in FIG. **5**, the status showing positioning cylinder **54** of the second rod **512** of the driven rod **51** is touching with an open end of the positioning bar **40**. The work position means, as shown in FIG. **7** or FIG. **9**, the positioning cylinder **54** of the second rod **512** of the driven rod **51** is lodged in any one of the positioning grooves **401**.

As shown in FIGS. **5** and **6**, when the thumb presses the pressing portion **21** of the operation rod **20**, the pressing portion **21** of the operation rod **20** moves close to the finger ring **102** of the grip **10**. And the positioning cylinder **54** of the second rod **512** of the driven rod **51** touches the positioning bar **40**. Further, the second rod **512** of the driven rod **51** is driven to rotate clockwise by the shaft **53**. Meanwhile, the first rod **511** connected with the second rod **512** is also driven to rotate clockwise by the shaft **53**. The recessed portion **5111** of the first rod **511** of the driven rod **51** is away from the stopping part **30**.

Please refer to FIG. **7**, in which when the thumb continuously presses the pressing portion **21** of the operation rod **20**, the positioning cylinder **54** of the second rod **512** of the driven rod **51** is pushed to be lodged in one positioning groove **401**. At the same time, the torsional spring **52** provides torsion for the driven rod **51** to rotate anticlockwise, so the positioning cylinder **54** of the second rod **512** of the driven rod **51** is lodged in one positioning groove **401** and the recessed portion **5111** at the open end of the first rod **511** of the driven rod **51** is engaged with the stopping part **30**.

When the operation handle comes to the work position for operation such as electrosurgical or clamping procedure, the work position may be kept. Further, the doctor (or user), may leave the operation handle to proceed with other necessary operations. Due to the torsion of the torsional spring **52**, the positioning cylinder **54** of the second rod **512** is firmly lodged in the positioning groove **401**. Even though the fingers of the user are moved away from the operation handle, the operation handle can be kept in the work position without releasing or moving.

When the doctor finishes the electrosurgical or clamping procedure, the operation handle should be released from the clamping or electrosurgical procedure, from the work position to the initial position, as shown in FIG. **7** to FIG. **5**. That is, the thumb of the user presses the operation rod **20** moving from the work position to the initial position. Meanwhile, the positioning cylinder **54** of the second rod **512** of the driven rod **51** is moved away from the positioning groove **401**. Due to the interaction between the positioning cylinder

54 of the second rod **512** and the positioning bar **40**, the second rod **512** of the driven rod **51** is driven to rotate clockwise by the shaft **53** and the recessed portion **5111** at the open end of the first rod **511** of the driven rod **51** is driven away from the stopping part **30**.

When the user presses continuously on the operation rod **20**, as shown in FIG. **5**, the positioning cylinder **54** of the second rod **512** of the driven rod **51** is totally away from the positioning bar **40** or is touching with the open end of the positioning bar **40**. At the same time, the force from the interaction provided by the positioning bar **40** is lapsed, so the torsional spring **52** provides torsion for the driven rod **51** to rotate anticlockwise and the recessed portion **5111** at the open end of the first rod **511** of the driven rod **51** is engaged with the stopping part **30** again.

Whereby, when the user is using with the operation handle in accordance with the present invention, no matter whether they want to clamp or to activate an electrosurgical procedure, to release the clamping or to stop electrosurgical procedure, it is very convenient for the user to use the operation handle as a scissor to clamp and open with fingers. When the grip **10** and the operation rod **20** are in the work position for clamping or activating the electrosurgical procedure, under the interaction between the driven member **50** and the positioning bar **40**, no other gesture or further operation is needed to maintain clamping or continue the electrosurgical procedure. When in release, it is easy for the user to use the operation handle as the scissor to open by fingers moving outwardly, without any additional pressing or operating. The grip **10** and the operation rod **20** can be returned to the initial position from clamping or the electrosurgical procedure. Thus, according to the operation handle of the present invention, the user can use it as a scissor without any additional practice or learning curve. The user does not need to think about how to release the clamping or electrosurgical procedure.

Please refer to FIGS. **7** to **9**, in which when the pressing portion **21** of the operation rod **20** is under the work position as shown in FIG. **7**, and if the user wants to clamp further firmly, they may keep pressing the pressing portion **21** of the operation rod **20**. The interaction between the positioning bar **40** and the driven member **50**, the positioning cylinder **54** of the second rod **512** of the driven rod **51** leaves the original positioning groove **401** and moves to another positioning groove **401**. Under the torsion of the torsional spring **52**, the positioning cylinder **54** is **1** firmly lodged in another positioning groove **401**. Thus, when the user keeps pressing the pressing portion **21** of the operation rod, the work position moves from the original one to another without additional pressing or operating. The operation is therefore intuitive, and the user does not require any further practice or learning curve. The user may be skilled in a short time, and avoid any negligent operation due to inexperience.

It will be apparent to those skilled in the art that various modifications and variations can be made to the present disclosure without departing from the spirit and scope of the disclosure. Thus it is intended that the present disclosure cover the modifications and variations of this disclosure provided they come within the scope of the appended claims and their equivalents.

What is claimed is:

1. An operation handle for electrocautery comprising:

a grip;

an operation rod having two ends, one end being jointly connected to the grip and the other end having a pressing portion, wherein the operation rod moves selectively from an initial position to at least one work position;

a stopping part disposed on the operation rod, being adjacent to the pressing portion;

a positioning bar disposed on the grip, comprising at least one positioning groove; and

a driven member comprising a driven rod and a torsional spring, wherein the driven rod is jointly connected to the operation rod and adjacent to the pressing portion, an end of the torsional spring is disposed against the operation rod and another end of the torsional spring is selectively disposed against the driven rod, and the torsional spring pushes against the driven rod so as to allow an end of the driven rod selectively stopping against the stopping part;

when the pressing portion of the operation rod is forced, the operation rod moves from the initial position to the at least one work position, and another end of the driven rod is lodged in the at least one positioning groove.

2. The operation handle for electrocautery according to claim **1**, wherein when the pressing portion of the operation rod is forced continuously, the operation rod moves from the one work position to another one work position, and the another end of the driven rod is lodged in another one positioning groove moved from the one positioning groove.

3. The operation handle for electrocautery according to claim **1**, further comprising when the operation rod and the driven rod are forced simultaneously, the operation rod moves from the at least one work position back to the initial position such that the end of the driven rod gets away from the stopping part, and the another end of the driven rod gets away from the at least one positioning groove.

4. The operation handle for electrocautery according to claim **1**, wherein the driven rod comprises a first rod and a second rod, the first rod and the second rod are connected and formed substantially as L-shape, an open end of the first rod is selectively disposed against the stopping part, and an open end of the second rod is lodged in the at least one positioning groove.

5. The operation handle for electrocautery according to claim **4**, wherein the at least one positioning groove is shaped in semicircle tubular and the open end of the second rod comprises a positioning cylinder, when the operation rod moves to the at least one work position, the positioning cylinder is lodged in the semicircle tubular positioning groove.

6. The operation handle for electrocautery according to claim **4**, wherein the stopping part is a pillar, and the open end of the first rod comprises a recessed portion corresponding to the shape of the pillar.

7. The operation handle for electrocautery according to claim **1**, wherein the pressing portion is shaped as a round ring.

8. The operation handle for electrocautery according to claim **1**, wherein the grip comprises a body, a finger ring, and a finger rest part, wherein the body and the finger rest part respectively connected to the finger ring in opposite direction.

9. The operation handle for electrocautery according to claim **8**, wherein the positioning bar extends outward from the connection of the finger ring and the finger rest part with an arc that is arcing with a center at the jointly connection of the grip and the operation rod.

* * * * *